

In the Claims:

1. (previously presented) A method of discovering, diagnosing and correcting formation integrity problems in successively drilled subterranean well bore intervals comprising the steps of:

(a) drilling a first well bore interval;

(b) determining if well bore fluid is being lost from said drilled well bore interval or if pressurized formation fluid is flowing into said drilled well bore interval, or both by circulating a well bore fluid through said drilled well bore interval for a period of time sufficient to determine if the quantity of said well bore fluid being circulated decreases due to well bore fluid outflow from said drilled well bore interval or increases due to pressurized formation fluid inflow into said drilled well bore interval;

(c) determining the pressure containment integrity of said drilled well bore interval;

(d) if it is determined that well bore fluid is being lost from said drilled well bore interval or pressurized formation fluid is flowing into said drilled well bore interval, or both, in step (b) or if it is determined that said pressure containment integrity is inadequate in step (c), providing a pumpable sealing composition for sealing said drilled well bore interval to prevent well bore fluid outflow therefrom, to prevent pressurized formation fluid inflow thereinto or to increase the pressure containment integrity of said drilled well bore interval;

(e) pumping said sealing composition into said drilled well bore interval to cause said drilled well bore interval to be sealed or the pressure containment integrity of said drilled well bore interval to be increased, or both;

(f) drilling a second well bore interval; and

- (g) repeating steps (b), (c), (d) and (e) for the second drilled well bore interval.
2. (canceled)
  3. (previously presented) The method of claim 1 wherein said well bore fluid is drilling fluid.
  4. (previously presented) The method of claim 1 wherein if it is determined that well bore fluid outflow from said drilled well bore interval is occurring or pressurized formation fluid inflow into said drilled well bore interval is occurring, or both, step (b) further comprises analyzing well logs and other relevant well bore data collected in said drilled well bore interval to diagnose the cause and extent of said well bore fluid outflow or formation fluid inflow, or both.
  5. (previously presented) The method of claim 1 wherein step (c) comprises increasing the density of or pressure exerted on a well bore fluid in said drilled well bore interval to an equivalent well bore fluid weight greater than or equal to the maximum hydrostatic pressure and friction pressure level to be exerted in said drilled well bore interval to determine if leak off occurs and the pressure containment integrity of said drilled well bore interval is inadequate.
  6. (original) The method of claim 5 wherein said well bore fluid is drilling fluid.
  7. (previously presented) The method of claim 5 wherein if the pressure containment integrity is inadequate, step (c) further comprises analyzing well logs and other relevant well bore data collected in said drilled well bore interval to diagnose the cause and extent of said inadequate pressure integrity containment.
  8. (previously presented) The method of claim 1 wherein when a pumpable sealing composition is provided in step (d), the pumpable sealing composition has the properties of

rapidly converting into high viscosity sealing masses upon commingling and reacting with well bore fluids which are diverted into, seal and strengthen weak zones and openings in the drilled well bore interval through which well bore fluid outflows or pressurized formation fluid inflows into said drilled well bore interval.

9. (original) The method of claim 1 wherein said pumpable sealing composition reacts with water in said drilled well bore interval and is comprised of oil, a hydratable polymer, an organophillic clay and a water swellable clay.

10. (original) The method of claim 1 wherein said pumpable sealing composition reacts with oil in said drilled well bore interval and is comprised of water, an aqueous rubber latex, an organophillic clay, sodium carbonate and a hydratable polymer.

11. (canceled)

12. (canceled)

13. (canceled)

14. (canceled)

15. (canceled)

16. (canceled)

17. (canceled)

18. (canceled)

19. (canceled)

20. (canceled)

21. (canceled)

22. (previously presented) The method of claim 7 wherein said well logs are run and said other relevant data is collected in real time and the real time data is transmitted to a remote location wherein the specific pumpable sealing composition to utilize is determined.

23. (previously presented) The method of claim 4 wherein said well logs are run and said other relevant data is collected in real time and the real time data is transmitted to a remote location wherein the specific pumpable sealing composition to utilize is determined.

24. (previously presented) A method of correcting a formation integrity problem in a drilled subterranean well bore interval comprising the steps of:

(a) determining the natural pressure containment integrity of said drilled well bore interval;

(b) providing a pumpable sealing composition for increasing the pressure containment integrity of said drilled well bore interval; and

(c) pumping said sealing composition into said drilled well bore interval to cause the pressure containment integrity of said drilled well bore interval to be increased to a value greater than the natural pressure containment integrity of said interval; and

(d) after step (c), confirming that the pressure containment integrity of said drilled well bore interval has been increased to a value greater than the natural pressure containment integrity of said interval by increasing the density of or pressure exerted on a well bore fluid in said drilled well bore interval to an equivalent well bore fluid weight greater than or equal to the maximum hydrostatic pressure and friction pressure level to be exerted in said drilled well bore interval and determining if leak off occurs.

25. (previously presented) The method of claim 24 wherein step (a) further comprises analyzing well logs and other relevant well bore data collected in said drilled well bore interval to diagnose the cause and extent of said formation integrity problem.

26. (previously presented) The method of claim 25 wherein said well logs are run and said other relevant data is collected in real time and the real time data is transmitted to a remote location wherein the specific pumpable sealing composition to utilize is determined.

27. (previously presented) The method of claim 24 wherein the pumpable sealing composition has the properties of rapidly converting into high viscosity sealing masses upon commingling and reacting with well bore fluids which are diverted into, seal and strengthen weak zones and openings in the drilled well bore interval.

28. (previously presented) The method of claim 27 wherein said pumpable sealing composition reacts with water in said drilled well bore interval and is comprised of oil, a hydratable polymer, an organophillic clay and a water swellable clay.

29. (previously presented) The method of claim 27 wherein said pumpable sealing composition reacts with oil in said drilled well bore interval and is comprised of water, an aqueous rubber latex, an organophillic clay, sodium carbonate and a hydratable polymer.

30. (previously presented) A method of discovering, diagnosing and correcting formation integrity problems in successively drilled subterranean well bore intervals comprising the steps of:

(a) drilling a first well bore interval;

(b) determining if well bore fluid is being lost from said drilled well bore interval or if pressurized formation fluid is flowing into said drilled well bore interval, or both by circulating a well bore fluid through said drilled well bore interval for a period of time sufficient

to determine if the quantity of said well bore fluid being circulated decreases due to well bore fluid outflow from said drilled well bore interval or increases due to pressurized formation fluid inflow into said drilled well bore interval;

(c) determining the pressure containment integrity of said drilled well bore interval;

(d) if it is determined that well bore fluid is being lost from said drilled well bore interval or pressurized formation fluid is flowing into said drilled well bore interval, or both, in step (b) or if it is determined that said pressure containment integrity is inadequate in step (c), providing a pumpable sealing composition for increasing the pressure containment integrity of said drilled well bore interval and, if necessary, sealing said drilled well bore interval to prevent well bore fluid outflow therefrom or pressurized formation fluid inflow thereinto;

(e) pumping said sealing composition into said drilled well bore interval to cause the pressure containment integrity of said drilled well bore interval to be increased to a value greater than the natural fracture pressure of said interval and, if necessary, to cause said drilled well bore interval to be sealed;

(f) drilling a second well bore interval; and

(g) repeating steps (b), (c), (d) and (e) for the next drilled well bore interval.

31. (canceled)

32. (previously presented) The method of claim 30 wherein if it is determined that well bore fluid outflow from said drilled well bore interval is occurring or pressurized formation fluid inflow into said drilled well bore interval is occurring, or both, step (b) further comprises analyzing well logs and other relevant well bore data collected in said drilled well bore interval

to diagnose the cause and extent of said well bore fluid outflow or formation fluid inflow, or both.

33. (previously presented) The method of claim 32 wherein said well logs are run and said other relevant data is collected in real time and the real time data is transmitted to a remote location wherein the specific pumpable sealing composition to utilize is determined.

34. (previously presented) The method of claim 30 wherein step (c) comprises increasing the density of or pressure exerted on a well bore fluid in said drilled well bore interval to an equivalent well bore fluid weight greater than or equal to the maximum hydrostatic pressure and friction pressure level to be exerted in said drilled well bore interval to determine if leak off occurs and the pressure containment integrity of said drilled well bore interval is inadequate.

35. (previously presented) The method of claim 34 wherein if the pressure containment integrity is inadequate, step (c) further comprises analyzing well logs and other relevant well bore data collected in said drilled well bore interval to diagnose the cause and extent of said inadequate pressure integrity containment.

36. (previously presented) The method of claim 35 wherein said well logs are run and said other relevant data is collected in real time and the real time data is transmitted to a remote location wherein the specific pumpable sealing composition to utilize is determined.

37. (previously presented) The method of claim 30 wherein when a pumpable sealing composition is provided in step (d), the pumpable sealing composition has the properties of rapidly converting into high viscosity sealing masses upon commingling and reacting with well bore fluids which are diverted into, seal and strengthen weak zones and openings in the drilled

well bore interval through which well bore fluid outflows or pressurized formation fluid inflows into said drilled well bore interval.